

DEC 29 2008

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

**PATENT
NON-FINAL**

IN THE CLAIMS:

1 - 13. (canceled)

14. (new) A magnetic transfer method for sorting, collecting, concentrating, transferring or dosing micro-particles (22) or magnetic particles either in the same liquid (23) or from one liquid (23a) into another (23b) by using a magnetic field, according to which method

- said particles are treated using a magnet unit (10) comprising a magnet (13) covered with a protective cover or coating (21) and a ferromagnetic tube (12),
- the magnet (13) and the ferromagnetic tube (12) being axially movable relative to each other for adjusting the magnetic field,
- the particles (22) are collected by using the magnet (13) covered with a protective cover or coating (21) so that when at least a part of the magnet is immersed in a liquid (23) the particles will gather on the surface of a protective cover or coating in an area (18) of a magnetic pole (24) of the magnet by means of magnetic field,
- the particles (22) are dosed by diminishing or removing the magnetic field by moving the magnet (13) inwards into the

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

ferromagnetic tube (12) or moving the ferromagnetic tube over the magnet,

said method being characterized as comprising

- using as said magnet, a magnet is selected from the group consisting of
 - a magnet, which is provided with at least one magnet magnetized in the transverse direction of the longitudinal axis of ferromagnetic tube (12),
 - a magnet (13), which is provided with at least one magnet magnetized in the direction of the longitudinal axis of ferromagnetic tube (12),
 - a magnet, which is comprising several magnetic poles (24) in the same body, and
 - a magnet (13), which is provided with individual magnets connected to each other or via suitable ferromagnetic or non-ferromagnetic adapters;
 - adjusting the collection surface area (18) on the surface of the protective cover or coating (21) by adjusting the length of the part of the magnet (13), which is protruding out from the ferromagnetic tube (12),
 - when collecting the particles (22), at least one magnet (13) is used having at least two poles (24a, 24b) partly or completely

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111.

PATENT
NON-FINAL

outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23), causing the particles to gather on the protective cover or coating (21) in the areas (18) close to the poles of the magnet or magnets, and

- when releasing or dosing the particles (22) the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12).

15. (new) The method according to claim 14, wherein

- the particles (22) are collected using at least one magnet (13) magnetized in the transverse direction of the longitudinal axis of ferromagnetic tube (12),

- when collecting the particles (22) the poles (24a, 24b) being partly or completely outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23), causing the particles to gather on the protective cover or coating (21) over the entire surfaces (18) of the poles of the magnet or magnets outside the ferromagnetic tube, and

- when releasing or dosing the particles (22) the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12).

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

16. (new) The method according to claim 14, wherein

- the particles (22) are collected using at least one magnet (13) magnetized in the direction of the longitudinal axis of ferromagnetic tube (12),
- when collecting the particles (22), at least two poles (24a,24b) of at least one magnet (13) are partly or completely outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23), causing the particles to gather on the protective cover or coating (21) in the areas (18) of the poles of the magnet or magnets outside the ferromagnetic tube, and
- when releasing or dosing the particles (22) the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12).

17. (new) The method according to claim 14, wherein the magnetic field is reduced by moving the ferromagnetic tube (12) over a magnet (13) placed inside a hard cup-like cover (21) or by pushing the tube into a space between an elastic protective coating and the magnet.

18. (new) The method according to claim 14, wherein the micro-particles (22) or magnetic particles are transferred by using

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

a magnet (13), which is located in an aperture of a ferro-alloy plate (12), wherein the intensity of the magnetic field is adjusted by moving the magnet (13) and/or plate (12) in relation to each other.

19. (new) A micro-particle (22) transfer device (10) for sorting, collecting, concentrating, transferring or dosing micro-particles or magnetic particles either in the same liquid (23) or from one liquid (23a) into another liquid (23b), said transfer device comprising

- a magnet unit (10) providing a magnet (13) covered with a protective cover or coating (21) and a ferromagnetic tube (12),
- the magnet (13) and the ferromagnetic tube (12) being axially movable relative to each other for adjusting the magnetic field,
- the magnet (13) having magnetic poles (24) and covered with a protective cover or coating (21) to be immersed in a liquid (23), for collecting particles on the surface of a protective cover or coating by means of magnetic field of the magnet,
- a ferromagnetic tube (12) for decreasing the magnetic field so that the magnet (13) is moved inwards into the tube or the ferromagnetic tube is moved over the magnet,

wherein

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

- the transfer device (10) comprises as said magnet, a magnet selected from the group consisting of
 - a magnet, which is provided with at least one magnet magnetized in the transverse direction of the longitudinal axis of ferromagnetic tube (12),
 - a magnet (13), which is provided with at least one magnet magnetized in the direction of the longitudinal axis of ferromagnetic tube (12),
 - a magnet, which is comprising several magnetic poles (24) in the same body, and
 - a magnet (13), which is provided with individual magnets connected to each other or via suitable ferromagnetic or non-ferromagnetic adapters;
- the collection surface area (18) on the surface of the protective cover or coating (21) and the length of the part of the magnet (13), which protrudes out from the ferromagnetic tube (12) is adjustable,
- at least one magnet (13) having at least two poles (24a, 24b) is partly or completely outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23) when collecting the particles (22), causing the particles to gather on the protective cover or coating (21) in the areas (18) close to the poles of the

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

magnet or magnets, and

- the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12) when releasing or dosing the particles (22).

20. (new) The transfer device (10) according to claim 19, wherein

- the magnet (13) is magnetized in the transverse direction of the longitudinal axis of ferromagnetic tube (12),
- the poles (24a, 24b) are partly or completely outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23) when the particles (22) are to be collected, causing the particles to gather on the protective cover or coating (21) over the entire surfaces (18) of the poles of the magnet or magnets being outside the ferromagnetic tube, and
- the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12) when releasing or dosing the particles (22).

21. (new) The transfer device (10) according to claim 19, wherein

- the magnet (13) is magnetized in the direction of the

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

longitudinal axis of ferromagnetic tube (12),

- at least two poles (24a, 24b) of the magnet (13) are partly or completely outside the ferromagnetic tube (12) and below the surface (25) of the liquid (23), causing the particles to gather on the protective cover or coating (21) in the areas (18) of the poles of the magnet or magnets being outside the ferromagnetic tube, and
- the poles (24a, 24b) of the magnet (13) are partly or completely inside the ferromagnetic tube (12) when releasing or dosing the particles (22).

22. (new) The transfer device (10) according to claim 19, wherein the magnet (13) magnetized transversely is located in the aperture of the ferro-alloy plate (12), the magnet being adjustable so that the magnetic field or the intensity of the magnetic field of the magnet is proportional to the protruding part of the magnet.

23. (new) The transfer device according to claim 19, wherein

- the ferromagnetic tube (12) is a cylinder and the magnet (13) is concentric with the ferromagnetic tube,
- the magnet (13) is magnetized in the transverse direction of the longitudinal axis of ferromagnetic tube (12) so that the poles

PATENT APPLN. NO. 10/531,464
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

(24a, 24b) of the magnet are on the sides of the magnet, and

- the magnet (13) is movable in the ferromagnetic tube (12) so that the magnet can be placed partly or completely outside the ferromagnetic tube or partly or completely inside the ferromagnetic tube.

24. (new) The transfer device (10) according to claim 19, wherein

- the protective coating (21) is a cup-like body of non-stretchable material, such as hard plastic or metal,
- and the protective coating (21) forms an extension of the ferromagnetic tube (12) so that, when pushed out of the tube, the magnet (13) can move inside the protective coating.

25. (new) The transfer device (10) according to claim 19, wherein the protective coating (21) is made of stretchable and elastic material which is stretched when the magnet (13) is being pushed out of the ferromagnetic tube (12).